LEVISA FORK SECTION 202
(FLOYD COUNTY, KENTUCKY)

FLOOD DAMAGE REDUCTION STUDY

SECTION 404 (b) (1) EVALUATION

U.S. Army Corps of Engineers, Huntington District
502 Eighth Street
Huntington, West Virginia 25701-2070

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I. INTRODUCTION

This report concerning measures proposed as part of the Section 202 (Floyd County, Kentucky) Flood Damage Reduction Study is submitted in accordance with Section 404 of the Clean Water Act of 1977 (Public Law 95-217).

The 404(b)(1) guidelines in 40 CFR 230 contain the substantive criteria for evaluation of proposed discharges of dredged or fill material under Section 404. The principle behind the criteria is that no discharge of dredged or fill material is permitted that would result in unacceptable adverse effects to the aquatic ecosystem. Compliance with the guidelines is evaluated by reviewing the proposed discharge with respect to the four restrictions in 40 CFR 230.10. These restrictions state that:

a) No discharge shall be permitted if there is a practicable alternative which would have less adverse impacts on the aquatic ecosystem;
b) No discharge shall be permitted if it violates state water quality standards, violates toxic effluent standards or prohibitions under Section 307 of Act, or jeopardizes the continued existence of threatened or endangered species as identified under the Endangered Species Act of 1973.
c) No discharge shall be permitted which will cause or contribute to the significant degradation of waters of the United States.
d) No discharge shall be permitted unless appropriate and practicable steps have been taken to minimize potential adverse impacts to the aquatic ecosystem.

II. PROJECT DESCRIPTION

A. Location

Floyd County is located within the Appalachian Mountains of Eastern Kentucky, in the watershed of the Levisa Fork of the Big Sandy River. The study area includes those floodplain areas that would be affected by a recurrence of the April 1977 flood within the Levisa Fork basin and the boundaries of Floyd County, Kentucky. The study area, primarily residential in nature, includes incorporated areas of Prestonsburg, Allen, Wayland, and Wheelwright, and unincorporated areas of Floyd County subject to flood damage from the potential recurrence of flooding similar to that which occurred in April 1977. Flood damage reduction for the City of Martin is being implemented separately, and is not included in this Proposed Action. Also included in the geographic scope of the Proposed Action study area are the floodplain areas located along tributaries of the

Levisa Fork that would be affected by backwater flooding from a recurrence of the April 1977 flood.

Refer to the Detailed Project Report-1 (DPR-1)/Draft Environmental Impact Statement (DEIS) dated March 2006, for specific information regarding this project, environmental data, and maps and photographs of the project area.

B. Description of Proposed Work

The Corps tentatively-selected plan includes a floodwall in Prestonsburg, Kentucky and a voluntary program of floodproofing (raise in place, veneer walls, and ringwalls), permanent floodplain evacuation of those structures not eligible for floodproofing. The non-structural measures would not affect waters of the United States and therefore are not addressed in this 404(b)(1) analysis.

The proposed floodwall would provide flood damage reduction for infrastructure, roadways, homes, and businesses in most of Prestonsburg through a combination of the floodwall, gates, raised roadways, curbs, and small wall sections in the downtown area.

The alignment begins at the intersection of South Lake Drive and Hughes Street, and follows Riverside Drive, Central Avenue, and South Front Street consisting of 1,662 feet of gravity wall, eight stoplog closures at driveways with two stoplog storage buildings, and raised roadway pavement. The floodwall length would be approximately 14,600 feet, with wall heights ranging from less than one foot to 11 feet tall along this length.

This structure would protect a total of 311 eligible structures in Prestonsburg, including 175 residential and 136 nonresidential structures. An additional 238 residential and 93 nonresidential structures that are not considered eligible for the Section 202 program would be protected behind the floodwall. [1] Construction of this floodwall would require mandatory relocation of nine residences.

This alignment extends around the downtown area and ties into high ground before reaching the wastewater treatment plant and protects to the one percent chance event. The upstream section of the Long Wall alignment achieves this level of protection by raising roadways and construction of a gravity wall up to 2.5 feet in height.

[1] Noneligible structures protected by the floodwall include structures partially protected by the one-foot "freeboard" and structures not meeting the "habitability" standard.

An I-wall floodwall begins near Goble Street and follows the top of riverbank for 900 feet transitioning into an existing levee, which would be raised, near the existing downtown pump station. This section of I-wall averages five feet in height and has two pedestrian gate closures and one 24-foot wide by 5.2-foot tall gate closure at the access road to the lower bank parking area.

The existing downtown pump station would be upgraded with a 400 kilowatts (KW) generator to provide backup power. A new 5 foot by 5 foot box culvert 1,705 foot long would be constructed to collect interior drainage in the downtown area and transport it to the existing pump station.

The I-wall begins again on the downstream side of KY 114, the main access into downtown Prestonsburg, and continues for 8,272 feet along the top of the riverbank ending in the KY 321 embankment, just upstream of the WTP. This section of I-wall averages eight foot in height and would have eight pedestrian openings and two 24 foot wide by 9.2 foot tall gate closures for access to the Prestonsburg High School lower parking area.

A new 108,000 gallon per minute (gpm) pump station would be located just downstream of the high school to pump the interior drainage over the floodwall during flood events. Additionally a gate well and ponding area would be required at the downstream end of the project between the college and waste water treatment plant.

Three borrow areas have been identified to provide random fill for the I-wall construction and are referred to as Prestonsburg (PB)-2 at 15.8 acres, Spurlock Creek at 17.2 acres, and Granny Fitz Branch at 15 acres. The Dewey Dam spoil area is currently being evaluated as a possible rock borrow and spoil disposal area for approximately 20,000 cubic yards of material.

This alignment also provides protection for an electrical substation adjacent to Prestonsburg High School. This substation would provide power to a proposed pump station in this section of the floodwall alignment. Construction in the area still remains a concern because of low-hanging power lines. Special precautions would be needed to protect workers, equipment and power lines.

This long wall alignment provides protection to the Big Sandy Community and Technical College (BSCTC).

C. Authority and Purpose

The purpose of agency action is to provide flood damage reduction measures to protect residents and properties within the floodplain of the Levisa Fork and its tributaries within Floyd County, KY. Agency action is needed to comply with Federal legislation in order to limit loss of life and property within the study area from future flood events.

The DPR-1/DEIS for Prestonsburg and the Lower Levisa Fork, Floyd County, Kentucky, Flood Damage Reduction Project is submitted as Appendix X to the Section 202 General Plan. The document is prepared in accordance with and in response to the following Congressional and ASA(CW) directives.

Section 202 of PL 96-367 (October 1980).

(1) Authorizes design and construction at full Federal expense of flood control measures as the USACE determines necessary and advisable.

(2) Requires affording a level of protection sufficient to prevent any future losses to the community from a recurrence of a flood such as the April 1977 flood.

(3) Non-Federal interests shall operate and maintain all such works after their completion, in accordance with regulations prescribed by the Secretary of the Army.

(4) Congress determined that: The benefits attributable to the project objectives exceed the costs of the measures authorized therein.

ASA(CW) Memo for the Acting Director of Civil Works (12 August 1982).

States in part: "The Corps should proceed to do whatever it can through proper design and by requiring adoption of appropriate nonstructural measures by local interests to reduce the intangible costs of a levee or floodwall failure or overtopping."

Fiscal Year (FY) 1982 Supplemental Appropriation Act (PL 97-257).

States in part: "Flood control measures authorized by Section 202 of the 1981 Energy and Water Development Appropriations Act involving high levees and floodwalls in urban

areas should provide for a Standard Project Flood (SPF)[2] level of protection when consequences from overtopping caused by large floods would be catastrophic."

ASA(CW) Memo for the Acting Director of Civil Works (4 October 1982).

States in part and referencing PL 97-257 as quoted previously: "In order to comply with this Congressional direction your proposed plan for structural protection at each community will have to include an evaluation in terms of this legislative provision."

Senate Report (No. 97-673) on FY 1983 Energy and Water Development Appropriations Act (6 December 1982).

States in part: "The Committee directs the Secretary of the Army, acting through the Chief of Engineers, to proceed as rapidly as possible with planning, engineering, land acquisition, and construction of the projects authorized by Section 202 of PL 96-367 ... with respect to the Tug Fork Valley, the Corps is directed to proceed to implement those measures, structural and nonstructural, identified in the F-1 plan as prepared by the Huntington District office.... The Corps should proceed with all planning efforts for those areas not presently afforded flood protection or for which such plans have not previously been complete."

House Joint Resolution 492 (PL 98-332, 3 July 1984).

(1) States in part: "Not withstanding current administrative procedures, the Secretary of the Army, acting through the Chief of Engineers, is directed to implement immediately nonstructural flood control measures such as relocation sites, floodproofing and floodplain acquisition and evacuation as described in the General Plan for Section 202 Program Implementation...."

(2) Appropriated $21 million to remain available until expended for nonstructural measures.

Section 103b. Of PL 99-662 (Water Resources Development Act (WRDA) 1986)

[2] A Standard Project Flood is defined as the discharge expected to result from the most severe combination of meteorological and hydrological conditions that are reasonably characteristic of the geographic region involved.

States in part: "the non-Federal share of the cost of nonstructural flood control measures shall be 25 percent of the cost of such measures. The non-Federal interests for any such measures shall be required to provide all lands, easements, rights-of-way, dredged material disposal areas, and relocations necessary for the project, but shall not be required to contribute any amount in cash during construction of the project."

PL 104-206 (30 September 1996).

States in part in Section 105: "From the date of enactment of this Act, non-structural flood control measures implemented under Section 202(a) of PL 96-367 shall prevent future losses that would occur from a flood equal in magnitude to the April 1977 level by providing protection from the April 1977 level or the 100-year frequency event whichever is greater."

Section 202 of PL 104-303 (WRDA of 1996).

States in part in Section 202(b): "the Secretary of the Army shall revise the criteria and procedures for calculating the non-Federal sponsor's ability to pay the non-Federal cost share."

PL 106-336 (The Energy and Water Development Appropriations Act of 2000)

Appropriates $25,150,000 for the Levisa and Tug Forks of the Big Sandy River and Upper Cumberland River.

D. Description of Material

1. General Characteristics of Proposed Fill Material

Completion of the proposed work would require the placement of fill materials below OWHL. An over-bank fill would be necessary for creation of 15-foot wide bench for stability of the levee. This over-bank fill would be composed of a random earthen fill, overlain by a 6-inch washed sand layer, and then covered by a 3-foot stone blanket of 24-inch top size. Geo-textile fabric would be placed between the sand and stone layers. Lower riverbank slopes in critical areas between Stations 57+00 to 62+00 and 105+00 to 124+00 would be protected by the addition of a stone buttress consisting of a wedge of 12-inch diameter top size stone.

2. Quantities of Fill Material

Total quantity of stone to be placed below top of bank is approximately 54,100 cubic yards. Sand quantity is approximately 9,025 cubic yards. Geo-textile fabric would be approximately 54,100 square yards.

3. Source of Material

All fill material would be obtained from either commercial sources or from the USACE Dewey Lake spoil site and would be free of contaminants.

E. Description of Proposed Discharge Sites

1. Location of the Sites

Two reaches of the Levisa Fork and three tributary streams would be affected by the placement of fill below the Ordinary High Water Level (OHWL). Applicable locations of the Levisa Fork include the reach between floodwall Stations 57+00 and 62+00 (between the Commonwealth bank and the SR 114 bridge in downtown Prestonsburg) and between floodwall Stations 105+00 and 124+00 (between Dickerson Street and Porter Lane). Trimble Branch is north of and adjacent to the First Commonwealth Bank in downtown Prestonsburg. May Branch is located north of and adjacent to the Prestonsburg High School. An unnamed tributary to the Levisa Fork (here called Campus Stream) is located on the campus of the BSCTC.

2. Size of Wetland Sites

No fill would be placed in wetlands. One 0.4-acre palustrine emergent wetland is located at the edge of the Construction Work Limit Approximately 0.06 acres is within the CWL.

3. Type of Aquatic Resources

The Levisa Fork originates in Buchanan County, Virginia and flows to Millard, Kentucky where it is joined by its largest tributary, Russell Fork, and continues in a northwesterly direction to Prestonsburg, Kentucky. From Prestonsburg it flows nearly due north to its junction with Tug Fork at Louisa, Kentucky. The confluence of the Tug and Levisa Forks forms the Big Sandy River. The total length of the Levisa Fork is approximately 164 miles, of which 34 miles are in Virginia and the balance in Pike,

Floyd, and Johnson Counties, Kentucky. The Levisa Fork drains a total of 2,326 square miles. The upper Levisa Fork drains portions of Pike County and Buchanan County, Virginia, while the lower Levisa Fork drains portions of Pike, Knott, Floyd, Johnson, Magoffin, Morgan, and Lawrence counties in Kentucky. Stream discharge rates at the mouth of the Levisa Fork range between 200 cubic feet per second (cfs) and the recorded maximum of 80,000 cfs, with a normal flow of 2,500 cfs.

Trimble Branch emanates from a large culvert and runs approximately 300 feet to its confluence with the Levisa Fork. It is approximately 15 feet wide and an estimated three feet deep. Velocity was estimated at 1 foot per second. The effect of backwater conditions associated with the rise of the Levisa Fork, including deep sedimentation, is evident. The banks are bare up to approximately 15 feet. The heavily vegetated steep upper banks are unstable. Canopy cover is approximately 50 percent during the growing season.

The upper reach of May Branch is approximately 360 feet in length and consists of 80 percent riffle, 5 percent run and 10 percent pool/glide habitat. The stream appears to have been channelized in the past, but has regained some natural dimension, pattern and profile. Water depth ranged from 0.10 feet to 0.55 feet. The stream width ranged from 2 to 6 feet wide. Frequent backwater conditions are likely based on the stream's appearance, but the lack of significant sediment in this upper portion of the stream indicates an ability to move particles through the system. The velocity was measured at 1 foot per second. There is neither canopy cover nor in-stream cover for this reach. The lower reach of May Branch is approximately 374 feet in length, consisting of 75 percent pool and 25 percent run habitat. A number of debris jams consisting of fallen trees and trash were present. The sediment is several feet deep in places and appears to be a permanent condition. Backwater conditions occur because of excessively high water levels when the Levisa Fork rises, which result in sedimentation and high erosion. The banks along this reach are bare, contributing additional sediment. The presence of this deep sedimentation reflects the stream's inability to move its sediment load through the system. This portion of May Branch has a nearly 100 percent canopy cover during the growing season from the large deciduous trees along the top of the bank.

The Campus Stream emanates from a culvert conveying drainage from a storm drain southeast of the BSCTC to a culvert under the entrance road. The stream runs approximately 560 feet with

limited dimension, pattern and profile is still relatively unstable, with bank erosion an issue. This reach of stream has almost total canopy cover during the growing season from large deciduous trees located along the stream banks. Grounds keepers maintain the grass to the water's edge. The lower reach of this Campus Stream has no visible boundary; however, the conditions in this reach are vastly different from the upper reach. This reach flows for approximately 461 feet until its confluence with the Levisa Fork. The banks are highly unstable. There is an abundance of sediment gray in color and more than a foot deep in places, most likely a result of evident backwater conditions. The stream bed also contains large amounts of rubble such as large cement slabs, discarded pipes, trees and pruned limbs, yard waste, and man made materials. During the growing season shrubs and deciduous trees provide almost complete canopy cover. Towards its confluence with the Levisa Fork there is a drop in slope of about 32 feet.

4. Timing and Duration of Discharge

Construction of would take approximately 5 years from initiation of construction.

F. Description of Disposal Method

Levisa Fork: The lower riverbank slopes in both areas would need to be protected using an armored toe consisting of a wedge of 12-inch diameter stone. Vegetation would be removed from the lower slope, and slopes would be graded prior to stone placement. A geotextile fabric would be selected and placed on the slope to provide separation between slope soils and strength to the stone armoring. The armored toe would be approximately ten feet wide and five feet high and would be founded about two feet below the normal river level. Vegetation would be allowed to naturally establish over this armored toe.

Trimble Branch: The entire stream length from the culvert to the Levisa Fork would be cleared of all vegetation and the banks stabilized with rip rap. A new culvert would be constructed in conjunction with the upgraded pump station. Once construction is complete, Trimble Branch would flow within the stabilized streambed from the culvert to the Levisa Fork.

May Branch: Plans for May Branch within the project area include clearing all vegetation, grading the side slopes to a rough trapezoidal channel, and constructing a pumping station. The slopes of the channel would be stabilized with rip-rap and a channel-within-channel streambed would be recreated. Once construction is complete, May Branch would flow within the recreated streambed from the roadway culvert to the toe of

the levee, where it would enter the pump station and another culvert. On the riverward side of the levee, water would exit the culvert and flow through a section stabilized with rip rap to the Levisa Fork. On the landward side of the pump station the channel would be used as a ponding area when necessary during high-water events.

Campus Branch: Plans for the Campus Branch within the project area include clearing some of the vegetation along the upper reach, grading the side slopes to a rough trapezoidal channel, and constructing a pump station. The slopes of the channel would be stabilized with rip-rap and a channel-within-channel streambed would be recreated. Once construction is complete, Campus Branch would flow within the recreated streambed from the roadway culvert to the toe of the embankment, where it would enter the pump station and another culvert. On the riverward side of the floodwall embankment, water would exit the culvert and use the existing streambed (lower reach) to the Levisa Fork. On the landward side of the pump station the channel would be used as a ponding area when necessary during high-water events. During normal flow, the Campus Branch would flow along the bottom of the channel through the pump station culvert to the Levisa Fork. During flood events, the Campus Branch would be blocked at the pump station and its flow, along with stormwater drainage from inside the floodwall/levee area, would collect in the streambed and be pumped over the wall into the Levisa Fork as necessary.

III. FACTUAL DETERMINATIONS

A. <u>Physical Substrate Determination</u>

1. Substrate Elevation and Slope

Levisa Fork: The overall streambed elevation and slope would not change. Where the armored toe is placed, the lower terrace would be regraded to a stable slope.

Trimble Branch: The streambed elevation would not change.

May Branch: Side slopes would be graded to a rough trapezoidal channel and a channel-within-channel streambed would be recreated.

Campus Branch: Towards its confluence with the Levisa Fork the Campus Branch has a drop in slope of about 32 feet. Plans for the Campus Branch within the project area include clearing some of the vegetation, grading the side slopes to a rough trapezoidal channel, and constructing a pump station. The slopes of the

channel would be stabilized with rip-rap and a channel-within-channel streambed would be recreated. Once construction is complete, Campus Branch would flow within the recreated streambed from the roadway culvert to the toe of the embankment, where it would enter the pump station and another culvert. On the riverward side of the floodwall embankment, water would exit the culvert and use the existing streambed (lower reach) to the Levisa Fork.

2. Comparison of Fill Material and Substrates at Discharge Sites

Levisa Fork: The overall site substrate is not anticipated to be changed as a result of the project. The substrate at the right bank would change in the areas where armored toe protection is needed. Near the right bank, substrate of the Levisa Fork behind the Commonwealth Bank and in the Blackbottom area was characterized as a mixture of sand, silt, and clay, with mud and detritus as organic components.

Where the armored toe is placed, the substrate would be changed to 12-inch diameter aggregate. The lower terrace would be regarded to a stable slope.

Trimble Branch: The streambed shows the effect of backwater conditions associated with the rise of the Levisa Fork, including deep sedimentation. The entire stream length from the culvert to the Levisa Fork would be cleared of all vegetation and the banks stabilized with rip rap. A new culvert would be constructed in conjunction with the upgraded pump station. Once construction is complete, Trimble Branch would flow within the stabilized streambed from the culvert to the Levisa Fork.

May Branch: Substrate in the upper reach of May Branch is a mixture of gravel, sand, and sediment. The lower reach of May Branch has sediment is several feet deep in places from backwater conditions. The presence of this deep sedimentation reflects the stream's inability to move its sediment load through the system. Side slopes would be graded to a rough trapezoidal channel and stabilized with rip-rap and a channel-within-channel streambed would be recreated.

Campus Branch: Substrate of he reach of the Campus Stream emanating from the culvert under the entrance road to the BSCTC is characterized as a mixture of clay, sand,, and silt. The lower reach has an abundance of sediment gray in color and more than a foot deep in places, most likely a result of evident backwater

conditions. The stream bed also contains large amounts of rubble such as large cement slabs, discarded pipes, trees and pruned limbs, yard waste, and man made materials. Post construction slopes of the channel would be rip-rap and the stream bed cleaned out.

3. Dredged/Fill Material Movement

Fill material would be composed of rock and concrete (to form culverts). The materials would be placed on stable geometries and properly embedded; no movement of material is expected.

4. Physical Effects on Benthos

Impacts to benthic communities would be both minor and temporary. Invertebrate benthic populations in the immediate armored toe construction area on the Levisa Fork, and in the tributary streams would be destroyed by construction activities. However, construction would create some new benthic habitat and it is anticipated that invertebrate organisms would repopulate these areas within a short period. Populations in areas adjoining the construction areas may be adversely affected as eroded materials settle to the stream bed downstream of the work sites.

5. Erosion and Accretion Patterns

Erosion and accretion patterns would be affected by the proposed work. Erosion rates would increase during construction because the disturbed soils and newly placed fill (above the OHWL) would be more susceptible to erosion than stable, vegetated soils. Erosion would also result from cleaning out and grading of tributary streams. As a consequence, accretion rates and patterns in the Levisa Fork would be slightly altered during construction.

Long-term, erosion rates into the tributary streams and into the Levisa Fork would be lowered. Existing tributary streambed dimensions would be kept as close as possible to existing dimensions, and slopes would be regraded and stabilized with rip rap.

Overall, impacts would be beneficial.

6. Actions Taken to Minimize Impacts.

Best management practices and reestablishment of vegetation would be used during construction to minimize excess

sedimentation during construction. To the extent possible, the USACE would schedule in-stream work during low-flow periods.

B. Water Circulation, Fluctuation, and Salinity Determinations.

1. Water

a. Salinity – Not applicable

b. Water Chemistry – During construction, run-off would introduce some suspended solids into the Levisa Fork. Minor and temporary fluctuations in water chemistry parameters would occur during construction. Normal conditions would return once construction is complete.

c. Clarity – Short- term increases in turbidity are expected. Best management practices and reestablishment of vegetation would be used during construction to minimize excess sedimentation during construction.

d. **Color** – Construction would increase erosion rates and put additional particulates into streams, altering water color during construction. Effects would be localized and limited to the construction period.

e. **Odor –** Implementation of this project is not expected to alter odor levels.

f. **Taste–** Implementation of this project is not expected to alter water taste.

g. **Dissolved Gas Levels –** Oxygen levels in the Levisa Fork would be expected to decrease during construction due to increased suspended solids and turbidity lowering the photosynthesis rate of aquatic vegetation. Levels would return to normal or improve following construction because tributary streambanks would be stabilized.

h. **Nutrients** – Nutrient levels would increase during construction because nutrients in disturbed soil and fill materials (above OHWL) are leached into the Levisa Fork. Effects would be minor and levels would return to normal post-construction.

i. **Eutrophication –** Streams and wetlands in the area would not become more eutrophic as a result of this project.

2. Current Patterns and Circulation.

a. **Current Patterns and Flow** – The Levisa Fork pattern and flow would not be appreciably changed during non-flood conditions. During flood conditions (approximately 2 percent chance and higher) the Levisa Fork would be constrained within the floodwall in the Prestonsburg area.

The hydraulic characteristics of the tributary streams would be modified slightly due to the introduction of stone and by altering flows through pump stations. During flood events (approximately 25 percent chance and higher), the May Branch and Campus Branch tributaries would be blocked at the pump station and their flow, along with stormwater drainage from inside the floodwall/levee area, would collect in the streambed, and would be pumped over the wall into the Levisa Fork as necessary.

b. **Velocity** – Water velocity would be affected during flood events when interior drainage is collected and retained in the stream to be pumped over the floodwall as necessary.

c. **Stratification** – Not applicable.

d. **Hydrologic Regime** – No significant changes.

e. **Aquifer Recharge** – Implementation of the proposed project would have no noticeable effect on aquifer recharge.

3. Normal Water Level Fluctuations

Normal non-flood fluctuations in water levels would not be affected by implementation of the proposed project. Levisa Fork water elevations would be slightly higher due to the floodwall, however HEC-RAS modeling indicates only a few inches difference in water elevation (outside protected areas) in flood situations, with minimal induced flooding from existing conditions.

Water levels of the May Branch and Campus Branch tributaries would increase during flood events when interior drainage is

collected and retained in the stream to be pumped over the floodwall as necessary.

4. Salinity Gradients

Salinity gradients are characteristic of salt water-fresh water mixing zones. None occur in the project area.

5. Actions that will be taken to minimize impacts.

Appropriate measures have been identified and incorporated in the proposed plan to minimize adverse effects of the project on the aquatic environment. These measures include stone slope protection of erosion prone areas, proper design and construction, use of environmentally acceptable fill material, and revegetation of exposed soils not protected by stone. Discharges would be limited to quantities necessary to achieve project objectives. Current patterns and circulation would be maintained through proper sizing of culverts.

J. <u>Suspended Particulate/Turbidity Determinations.</u>

1. Suspended particulates and turbidity level

Levels is expected to increase temporarily during construction. However, best management practices would minimize these effects. Turbidity is expected to decrease in the long-term through the stabilization of existing oversteepened, failing and eroding streambanks.

2. Effects on chemical and physical properties of the water column

a. Light Penetration – Increased suspended solid particulate and turbidity levels would reduce light penetration of the Levisa Fork during construction. This would not be a substantial impact given the already degraded nature of the Levisa Fork in this area. Best management practices would be employed during construction to minimize turbidity levels.

b. Dissolved Oxygen – Oxygen levels in the Levisa Fork would be expected to decrease during construction due to increased suspended solids and turbidity lowering the photosynthesis rate of aquatic vegetation. Levels would

return to normal or improve following construction because tributary streambanks would be stabilized.

c. Toxic Metals and Organics – It is not expected that current levels of toxic metals in streams would be affected. Commercial sources or the USACE Dewey Dam spoil site are planned sources for rock fill material. Soil borrow sites are not expected to contain high levels of toxic metals and organics. This would be confirmed prior to borrow activity.

d. Pathogens – Fill materials will be clean and free of pathogens.

e. Aesthetics – The aesthetic nature of the tributary streams would be reduced during construction. Existing aesthetic quality of tributary streams is diminished by the presence of erosion, sedimentation, trash and other debris. Stabilizing the banks would not have a significant effect on the aesthetic quality of the stream and surrounding area.

3. Effects on Biota

a. Primary Production, Photosynthesis – No significant effects. The limited plant communities in the Levisa Fork in the project area would have lower photosynthesis rates resulting from reduced light penetration. This temporary impact would be largely limited to the work area.

b. Suspension/Filter Feeders – Collectors and filter feeders such as mayfly nymphs or caddis larvae would be affected if populations exist in project area streams. However, impacts would be temporary and limited to the project area and immediately downstream.

c. Sight Feeders - No significant effects are anticipated. Sight feeders, primarily fish, would have increased difficulty finding food in the Levisa Fork in turbid waters near the construction area. However, populations are mobile and able to migrate from the area. Effects would be minor and temporary.

4. Action to Minimize Impacts.

Construction areas would be protected to prevent erosion using best management practices. Placed rock as stone slope protection would minimize bank erosion and related turbidity levels. Fill

quantities would be limited to amounts necessary to achieve project objectives and, to the degree practicable, would be placed during low-flow period.

K. Contaminant Determination

1. Evaluation of the Biological Availability of Possible Contaminants in the Fill Material

a. Physical Characteristics of the Fill Material - Rock borrow and concrete would be obtained from commercial sources and/or from the USACE Dewey Dam spoil site. Soil for fill (above the OHWL) would be from local borrow areas. Identified soil borrow areas include Granny Fitz Branch, Spurlock Creek Branch, and PB-2. Refer to DPR-1/DEIS for mapping of these sites.

b. Hydrography in Relation to Known or Suspected Sources of Contamination – Sources of contamination in the immediate project area were reviewed in the Phase I HTRW Investigation for this project. No sources were identified which would affect placement of the floodwall. The Granny Fitz Branch and Spurlock Creek Branch borrow areas contain streams that could be contaminated by sources such as livestock or mining. However, a 100-foot buffer would be maintained between streams and soil borrow activities.

c. **Results from Previous Testing of the Material or Similar Material in the Vicinity of the Project** – Potential fill from borrow sites has not yet been tested.

d. **Known, Substantive Sources of Persistent Pesticides from Land Runoff or Percolation** – No substantive sources of pesticide contamination have been identified.

e. **Spill Records for Petroleum Products or Designated Hazardous Substances** – The Phase I HTWR Report for this project did not identify HTRW concerns for the floodwall alignment.

f. **Other Public Records of Significant Introduction of Contaminants from Industries, Municipalities or Other**

Sources – The Phase I HTWR Report for this project did not identify HTRW concerns for the floodwall alignment.

g. Known Existence of Substantial Deposits of Substances Which Could Be Released in Harmful Quantities by Man-Induced Discharges – The Phase I HTWR Report for this project did not identify HTRW concerns for the floodwall alignment.

2. Contaminant Determination

An evaluation of the appropriate information above indicates that there is reason to believe the proposed fill material would not be a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and are not likely to contaminate. Therefore the material would meet the testing exclusion criteria.

L. Aquatic Ecosystem an Organism Determinations

1. Effects on Plankton

Turbidity levels may temporarily affect plankton populations through abrasions by suspended material and light transmission reduction. However, impacts would be temporary.

2. Effects on Benthos

Impacts to benthic communities would be both minor and temporary. Invertebrate benthic populations in the immediate armored toe construction area on the Levisa Fork, and in the tributary streams would be destroyed by construction activities. However, construction would create some new benthic habitat and it is anticipated that invertebrate organisms would repopulate these areas within a short period. Populations in areas adjoining the construction areas may be adversely affected as eroded materials settle to the stream bed downstream of the work sites.

3. Effects on Nekton

Streams in the area are already degraded and nekton populations are limited. Effects would be minor and temporary since it is anticipated that these species would migrate from the work areas when construction begins and would return or populate the stabilized streams once the project is complete.

4. Effects on Aquatic Food Web

Populations in tributary streams would be lost and populations in the Levisa Fork reduced during construction. Once work in tributary streams is completed, the aquatic food web would return, likely in better condition due to stream stabilization.

5. Effects on Special Aquatic Sites

Several streambed features, special aquatic sites, were identified in the Levisa Fork along the proposed floodwall alignments. These features are not always visible because of the Levisa Fork's changing water levels. They are generally visible only during low water conditions. The features noted during site reconnaissance include:

- **Site A**: A potential riffle area just upstream of the floodwall, at approximate RM 54.15.
- **Site B**: A vegetated shallow along the left bank at approximate RM 53.82. The bar surfaces are submerged except during low water conditions.
- **Site C**: A vegetated shallow along the right bank at approximate RM 53.45. The bar surfaces are submerged except during low water conditions.
- **Site D**: A vegetated shallow along the left bank at approximately RM 52.2. The bar surfaces are submerged except during low water conditions.

HEC-2 modeling prepared by the Huntington District USACE was reviewed for predicted velocity changes in the Levisa Fork associated with floodwall placement. Predicted changes in water velocity from implementing structural measures were evaluated with respect to potential impact on special aquatic sites in the Levisa Fork. The existing conditions show that lateral bars, pools and riffles within this reach are most likely formed, moved, and transformed periodically under existing conditions. Additional impacts to the formation and stability of identified aquatic sites from the proposed project should be minor. Special aquatic site B, a vegetated shallow along the left bank at approximate RM 53.82, is closest to the proposed bank stabilization behind the First Commonwealth Bank.

During construction, the habitat functions of these sites would be impaired by factors discussed in Section II.J. The sites would be expected to recover post-construction. Conditions for the special aquatic sites could improve as a result of long-term decreased sedimentation from stabilized project-area tributaries and Levisa Fork streambanks.

Wetlands – One 0.4-acre palustrine emergent wetland is located at the edge of the Construction Work Limit Approximately 0.06 acres is within the CWL. No structural elements are proposed within the wetland. The wetland is in part of the area planned for interior drainage collection during flood events. No adverse effect to this wetland is anticipated. No excavation, grading, or equipment staging is planned for this area. Periodic collection of interior drainage in this area may enhance this wetland. No adverse effect to wetlands is anticipated. During project implementation, BMPs would be used to minimize the potential for release of fuels and other petroleum products.

6. Effects on Threatened and Endangered Species

The area is within the range of the Indiana Bat. Clearing of the site would occur during the dormancy period of the Indiana Bat. The Corps, in consultation with the USFWS and KDFWR, plans to conduct needed clearing activities during winter months (November 15 through March 31) to avoid potential direct impact (i.e., injury) to the Indiana bat. If tree removal would be required outside of this time frame, the Corps would coordinate with the USFWS and KDFWR to ensure the necessary precautions are implemented to avoid impact to the Indiana Bat.

7. Effects on Other Wildlife

There would be minimal impact to other wildlife.

8. Actions to Minimize Impacts

The proposed material placement activities would be accomplished under conditions that would minimize, to the extent practicable, adverse effects on aquatic ecosystem. Best management practices would be employed to avoid sedimentation. Specific actions include:

- Fills would be limited to the amount necessary to achieve project objectives.
- Fill material would be clean and free of contaminants
- Every effort would be made to place fill materials during low-flow periods.
- Temporary fill, if any, would be removed.
- An erosion control plan would be implemented to control the entry of sediments into streams and their migration downstream of the work areas.

9. Compensatory Actions to Mitigate Impacts

In-lieu fee compensation is proposed for tributary streams affected. Based on the agreement concerning in-lieu mitigation fees between KDFWR and USACE, compensatory mitigation through the payment of in-lieu fees is available when project impacts can not be avoided, minimized, or mitigated on site. In-lieu fee recipients use the money to identify appropriate stream and wetland restoration opportunities in Kentucky with the intent to conduct mitigation projects as close to the impacted site as possible.

M. Proposed Disposal Site Determinations

1. Mixing Zone Determination

a. Depth of Water at the Disposal Site – Depth of water varies according to rain event. The Levisa Fork is around five feet deep under base flow conditions in this area. For a 50 percent chance event, depth was modeled at 33 feet. Tributary streams also vary greatly as to depth.

b. Current Velocity, Direction, and Variability – Levisa Fork velocities within the project area vary between 1-5 feet per second for a 50 percent chance event condition, depending on location.

c. Degree of Turbulence – Turbulence varies according to stream velocity.

d. Water Column Stratification – The Levisa Fork is not expected to have significant stratification since there is a current.

e. **Rate of Discharge –** Rate of discharge of the Levisa Fork varies widely according to storm events. Base rate of discharge is 300 cubic feet per second. For a 50 percent chance storm event, rate of discharge is modeled at 25,600 cubic feet per second.

f. **Ambient Concentrations of Constituents of Interest –** No Constituents of Interest have been identified.

g. **Dredged Material Characteristics –** The concrete and rip rap fills will be stable to the extent that the concept of a mixing zone does not apply. Soil fill (above the OHWL) would contain varying quantities of fines. Best management practices would be used to limit erosion into the Levisa Fork.

h. **Number of Discharges Per Unit of Time –** Discharges would occur at intervals throughout the construction period.

2. Disposal Site and Size

An evaluation of the appropriate factors indicates that the disposal site and/or sizes of the mixing zone are acceptable.

3. Actions to Minimize Adverse Discharge Effects

The proposed material placement activities would be accomplished under conditions that would minimize, to the extent practicable, adverse effects on aquatic ecosystem. Best management practices would be employed to avoid sedimentation. Specific actions include:

- Fills would be limited to the amount necessary to achieve project objectives.
- Fill material would be clean and free of contaminants
- Every effort would be made to place fill materials during low-flow periods.
- Temporary fill, if any, would be removed.
- An erosion control plan would be implemented to control the entry of sediments into streams and their migration downstream of the work areas.

4. Determination of Compliance with Applicable Water Quality Standards

Fill activities have been coordinated with and are in conformance with the State of Kentucky standards.

5. Potential Effects on Human Use Characteristics

a. Municipal and Private Water Supply – The Prestonsburg City Utilities Commission withdraws water from Levisa Fork of the Big Sandy River near its treatment plant at 2560 South Lake Drive, Prestonsburg. Southern Water and Sewer District withdraws water from the Levisa Fork branch of the Big sandy River near its plant in Allen. Both intakes are well upstream of the proposed project, and no impact is anticipated. No private wells are known in the project area.

b. Recreational and Commercial Fisheries – No commercial fisheries would be affected. Limited numbers of individual fisherman would be prevented from fishing in this area during construction.

c. Water-Related Recreation – Limited water-related recreation occurs on the Levisa Fork in this area. Canoe and/or small fishing boats would be prevented from using this area of the Levisa Fork during construction.

d. Aesthetics of the Aquatic Ecosystem – The aesthetic nature of the area would be reduced during construction. Existing aesthetic quality of tributary streams is diminished by the presence of erosion, sedimentation, trash and other debris. Stabilizing the banks would not have a significant effect on the aesthetic quality of the stream and surrounding area. For more information regarding total project aesthetics, refer to the DPR-1/DEIS.

e. Parks, National and Historical Monuments, National Seashores Wilderness Areas Research Sites, and similar Preserves – Not applicable.

N. Determination of Cumulative Effects of the Aquatic Ecosystem

Protection of the streambank would provide a long-term benefit to the tributary streams and the Levisa Fork through bank stabilization leading to reduced erosion.

O. Determination of Secondary Effects on Aquatic Ecosystems

Secondary effects would include temporary increased stream suspended particulates and turbidity from erosion of construction-disturbed soils. A secondary effect could occur from construction equipment fuel or lubricant spillage. Best management practices would be used to limit these effects.

III. FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

A. Adoption of the Section 404(b)(1) Guidelines to this Evaluation

No significant adaptations of the guidelines were made relative to this evaluation.

B. Evaluation of the Availability of Practicable Alternatives to the Proposed Discharge Sites Which Would Have Less Adverse Impacts on the Aquatic Environment

A series of alternative floodwall alignments were developed and evaluated for feasibility. Two were carried forward for full evaluation in the DPR-1/DEIS as components of alternatives plans. The No Federal Action Alternative and a completely nonstructural alternative were also evaluated in the DPR-1/DEIS.

C. Compliance with Applicable State Water Quality Standards

Fill activities have been coordinated with and are in conformance with the Commonwealth of Kentucky standards. A 401 Water Quality Certification will be obtained from the Division of Water prior to construction.

D. Compliance with Applicable Toxic Effluent Standards or Prohibitions under Section 307 of the Clean Water Act

Section 307 of the Clean Water Act establishes limitation or prohibitions on the discharge materials containing certain toxic pollutants. The

discharges associated with the proposed work would not contain these toxins, and therefore the project complies with Section 307.

E. Compliance with the Endangered Species Act of 1973

No threatened or endangered species or their critical habitat would be affected by the proposed project. This project complies with the stipulations of the Endangered Species Act.

F. Compliance with Specific Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

Not applicable.

G. Evaluation of the Extent of Degradation of Waters of the United States

1. Significant Adverse Effects on Human Health and Welfare

a. Municipal and Private Water Supplies – The project would not affect municipal or private water supplies.

b. Recreational or Commercial Fisheries - Impacts to recreation will be minimal. No commercial fisheries are located in the project area.

c. Plankton – Adverse impacts will be minor and limited to the construction period.

d. Fish – Adverse impacts will be minor and limited to the construction period.

e. Shellfish – No shellfish populations have been identified. No impact is anticipated.

f. Wildlife - Adverse impacts will be minor and limited to the construction period.

g. Special Aquatic Sites – A beneficial impact is anticipated for the 0.4-acre wetland adjacent to the project area. Temporary adverse impacts to existing special aquatic sites in the Levisa Fork are offset by predicted long-term benefits from reduced erosion post-construction.

2. Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystem

Direct and indirect impact to aquatic ecosystems would not be significant because of measures taken to minimize impacts and by compensatory mitigation for impacts to streams.

3. Significant Adverse Effect on Aquatic Ecosystem Diversity, Productivity, and Stability

The Levisa Fork and tributary streams in this area have limited diversity and banks are unstable under existing conditions. A positive effect on aquatic ecosystems is expected from implementation of the proposed project.

4. Significant Adverse Effect on Recreational, Aesthetic, and Economic Values

Significant adverse effects to recreational, aesthetic, and economic values would not occur. The proposed project is expected to provide an overall socioeconomic benefit by reducing flood damages in Prestonsburg, Kentucky.

H. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Appropriate steps to minimize potential adverse impacts from any discharges on aquatic systems have been incorporated.

I. Finding

The proposed discharges of fill material are specified as complying with the requirements of the 404(b)(1) Guidelines, with the inclusion of appropriate and practicable conditions as identified herein to minimize pollution or adverse effects on the aquatic ecosystem. These conditions will be attached and made part of the project record.

Approved by: _____

Date: _____